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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/923,461	09/04/1997	VIET LE	RIC-96-153	2639

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EXAMINER
SEDIGHIAN, REZA

ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 06/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

PR4

Office Action Summary	Application No.	Applicant(s)	
	08/923,461	LE ET AL.	
	Examiner	Art Unit	
	M. R. Sedighian	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 February 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *41-77* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *41-77* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

1. This communication is responsive to applicant's 02/26/2002 amendment in the application of Viet Le et al. for "Method and System for Modulator Multiplexing and Amplification in a Multi-Channel Plan", filed 09/04/1997. The amendment to the claim have been entered. Claims 41-77 are now pending.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 41-77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clark (Us patent No: 6,041,152) in view of Kirkby et al. (US patent No: 5,452,116).

Regarding claim 41, 49, 57, 65, Clark discloses a method of multiplexing/demultiplexing optical signals (col. 1, lines 8-10 and fig. 1) in a set of multiple channels (col. 3, lines 3-6) within an operating window (1530 nm to 1560 nm) of a fiber communication network (col. 3, lines 52-56), comprising: fine wavelength division demultiplexing (6, fig. 1) the optical signal into a first set of subgroups of optical signals (1530.08-1535.29 nm, and 1537.94-1543.19 nm signals), each subgroup corresponds to a respective subwindow within the operating window (the subgroup consisting of optical signals within the range of 1530.08-1535.29 nm comprises of a plurality of optical signals that can form a subwindow within the operating window); coarse wavelength division demultiplexing (1, fig. 1) the first set of subgroups (1530.08-1535.29 nm, and 1537.94-1543.19 nm signals) into a group of optical signals (1530.08-1535.29 nm) within the operating

window. Clark differs from the claimed invention in that Clark does not disclose amplifying optical signals corresponding to each subwindow by using different optical line amplifiers. Kirkby discloses optical line amplifiers (15b, figs. 1, 3) between an optical demultiplexer (15a, figs. 1, 3) and an optical multiplexers (15c, fig. 1, 3). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate optical line amplifiers such as the ones of Kirkby for line amplification in the optical mutiplex/demultiplex transmission system of Clark in order to boost the light signals that are attenuated during the transmission. Furthermore, it is well known that an optical line amplifier can be placed anywhere along the transmission path to restore the signal to a desired level. As to claims 49 and 65, Clark further discloses a plurality of fine wavelength division demultiplexing units (6, 7, fig. 1).

Regarding claim 42, Clark further discloses coarse wavelength division multiplexing (2, fig. 1) the optical signals into a second set of subgroups (1530.08-1535.29 nm, and 1537.94-1543.19 nm signals), and a fine wavelength division multiplexing (8, fig. 1) the optical signals within a respective subgroup into individual channels (col. 4, lines 4-6).

Regarding claim 43, Clark further discloses the first subwindow comprises a first group of channels (1530.08-1535.29 nm) and the second subwindow comprises a second group of channels (1537.94-1543.19 nm).

Regarding claim 44, Clark further discloses channels in the range of wavelengths between 1530 to 1536 nm (col. 4, line 3).

Regarding claim 45, Clark further discloses channels in the range of wavelengths between 1547 to 1553 nm (col. 4, line 1).

Regarding claim 46, Clark differs from the claimed invention in that Clark does not discloses disclose demultiplexing the optical signals into third and fourth subgroups of optical signals. Clark discloses the variations and modifications of the invention can be made and the number of channels may be freely varied (col. 8, lines 46-53). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate a multiplex/demultiplex transmission system such as the one of Clark in order to further demultiplex the optical signals into a third and a fourth subgroups of channels to provide additional channel transmission and an increase the transmission capacity.

Regarding claim 47, Clark further discloses channels in the range of wavelengths between 1538 to 1543 nm (col. 4, line 3).

Regarding claim 48, Clark further discloses channels in the range of wavelengths between 1555 to 1561 nm (col. 4, line 1).

Regarding claim 50, 58, 66, Clark further discloses the demultiplex/multiplex unit (1, fig. 1) is further configured to multiplex the optical signals into a second set of subgroups of signals (col. 3, lines 55-56), and a second plurality of fine wavelength multiplex units (4, 5, fig. 1).

Regarding claims 51, 59, 67, Clark further discloses multiplexing (4, 5, fig. 1) the optical signals into first (col. 3, line 67, col. 4, line 1) and second subgroups of signals (col. 4, line 1).

Regarding claims 52, 60, 68, Clark further discloses channels in the range of wavelengths between 1530 to 1536 nm (col. 4, line 3).

Regarding claims 53, 61, 69, Clark further discloses channels in the range of wavelengths between 1547 to 1553 nm (col. 4, line 1).

Regarding claims 54, 62, 70, Clark differs from the claimed invention in that Clark does not disclose demultiplexing the optical signals into third and fourth subgroups of optical signals. Clark discloses the variations and modifications of the invention can be made and the number of channels may be freely varied (col. 8, lines 46-53). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate a multiplex/demultiplex transmission system such as the one of Clark in order to further demultiplex the optical signals into a third and a fourth subgroups of channels to provide additional channel transmission and an increase the transmission capacity.

Regarding claims 55, 63, 71, Clark further discloses channels in the range of wavelengths between 1538 to 1543 nm (col. 4, line 3).

Regarding claims 56, 64, 72, Clark further discloses channels in the range of wavelengths between 1555 to 1561 nm (col. 4, line 1).

Regarding claims 73, 75, and 77, Clark further discloses coarse wavelength multiplexing (1, fig. 1), fine wavelength multiplexing (4, 5, fig. 1), fine wavelength demultiplexing (10, 11, fig. 1), and coarse demultiplexing (2, fig. 1). As to claim 77, Clark further discloses the multiplex/demultiplex unit configured to support bi-direction optical signal traffic (col. 3, lines 52-62).

As to claims 74 and 76, they require similar limitations as recited in claim 1, as discussed above.

4. Claims 41-43, 46, 49-51, 54, 57-59, 62, 65-67, 70, and 73-77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. (US patent No: 5,909,295) in view of Kirkby et al. (US patent No: 5,452,116), or Giles (US patent No: 5,633,741).

Regarding claim 41, 49, 57, and 65, Li discloses a method of multiplexing/demultiplexing optical signals (col. 1, lines 4-8) in a set of multiple channels (col. 2, lines 10-14) within an operating window (Red Band + Blue Band, fig. 7) of a fiber communication network (col. 5, lines 45-61), comprising: fine wavelength division demultiplexing (Filters 1, 4, 7, fig. 7) the optical signal from individual channels of the set of multiple channels into a first set of subgroups of optical signals (λ1, λ4, λ7, fig. 7), each subgroup corresponds to a respective subwindow (Blue Band, fig. 7) within the operating window (Red Band + Blue Band, fig. 7); coarse wavelength division demultiplexing (70a, FBG2,3, FBG5,6, FBG8,9, fig. 7) the first set of subgroups (λ1, λ4, λ7, fig. 7) into a group of optical signals within the operating window. Li differs from the claimed invention in that Li does not disclose amplifying optical signals corresponding to each subwindow by using different optical line amplifiers. Kirkby discloses optical line amplifiers (15b, figs. 1, 3) between an optical demultiplexer (15a, figs. 1, 3) and an optical multiplexers (15c, fig. 1, 3). Giles discloses optical line amplifiers (22, 23, fig. 2) between optical multiplexers/demultiplexers (20, 28, 29 and 21, 30, 31, fig. 2). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate optical line amplifiers such as the ones of Kirkby or Giles for line amplification in the optical mutiplex/demultiplex transmission system of Li in order to boost the light signals that are attenuated during the transmission. Furthermore, it is well known that an optical line amplifier can be placed anywhere along the transmission path to restore the signal to a desired

level. As to claims 49 and 65, Li further discloses a plurality of fine wavelength division demultiplexing units (Filters 2, 5, 8, 3, 6, 9, fig. 7).

Regarding claims 42, 50, 58, and 66, Li further discloses coarse wavelength division multiplexing (70b, FBG10,11, FBG13,14, FBG16,17, fig. 7) the optical signals into a second set of subgroups (λ12, λ15, λ18, fig. 7), and a fine wavelength division multiplexing (Filters 12, 15, fig. 7) the optical signals within a respective subgroup into individual channels (λ15, λ18, fig. 7).

Regarding claim 43, Li further discloses the first subwindow (Blue Band) comprises a first group of channels (λ1, λ4, λ7, λ2, λ5, λ8, λ3, λ6, λ9, fig. 7) and the second subwindow (Red Band) comprises a second group of channels (λ10, λ13, λ16, λ17, λ14, λ11, λ18, λ15, λ12, fig. 7).

Regarding claims 46, 54, 62, and 70, Li further disclose demultiplexing the optical signals into third (λ2, λ5, λ8, fig. 7) and fourth subgroups (λ3, λ6, λ9, fig. 7) of optical signals.

Regarding claims 51, 59, and 67, Li further discloses multiplexing (Filters 11, 12, 14, 15, fig. 7) the optical signals into first (λ17, λ14, λ11, fig. 7) and second subgroups (λ18, λ15, λ12, fig. 7) in a corresponding subwindow (Red Band, fig. 7).

Regarding claims 73, 75, and 77, Li further discloses coarse wavelength multiplexing (70b, FBG10,11, FBG13,14, FBG16,17, fig. 7), fine wavelength multiplexing (Filters 11, 12, 14, 15, fig. 7), fine wavelength demultiplexing (Filters 1, 2, 3, 4, fig. 7), and coarse demultiplexing (70a, FBG2,3, FBG5,6, FBG8,9, fig. 7). As to claim 77, Li further discloses the multiplex/demultiplex unit configured to support bi-direction optical signal traffic (col. 1, lines 1-2, 32-33 and fig. 7).

As to claims 74 and 76, they require similar limitations as recited in claim 1, as discussed above.

5. Claims 44-45, 47-48, 52-53, 55-56, 60-61, 63-64, 68-69, and 71-72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. (Us patent No: 5,909,295) in view of Kirkby et al. (US patent No: 5,452,116), or Giles (US patent No: 5,633,741) and further in view of Roberts et al. (US patent No: 5,801,858), or Meli et al. (US patent No: 5,946,117).

Regarding claims 44-45, 47-48, 52-53, 55-56, 60-61, 63-64, 68-69, and 71-72, the combination of Li and Kirkby, or Giles further differs from the claimed invention in that Li and Kirkby, or Giles do not specifically disclose the signal bands are in the range 1530 to 1536 nm, 1547 to 1553 nm, 1538 to 1543 nm, and 1555 to 1561 nm. Roberts discloses an optical transmission system (fig. 3), wherein the transmitted signals (Red, Blue, fig. 3) are in the range of 1530 to 1536 nm, 1547 to 1553 nm (col. 8, lines 23-30). Meli discloses an optical transmission system (fig. 14), wherein the transmitted signals ($\lambda 1$, $\lambda 2$, $\lambda 3$, $\lambda 4$, fig. 14) are in the range of 1530 to 1536 nm, 1547 to 1553 nm, 1538 to 1543 nm, and 1555 to 1561 nm (col. 17, lines 1-3). Therefore, it would have been obvious to an artisan at the time of invention to incorporate wavelength ranges of 1530 to 1561 nm such as the ones of Roberts or Meli for transmission channels in the modified optical multiplex/demultiplex transmission system of Li and Kirkby, or Giles in order to provide a plurality of different channels to transmit data at high bit rates.

6. Applicant's arguments filed 2/26/02 have been fully considered but they are not persuasive.

The remark states that applicant intend to submit a Declaration under 37 C.F.R. § 1.131 to remove the Clark reference. However, examiner did not find such Declaration in the file, and therefore, the rejection under Clark still stands.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Pan et al. (Us patent No: 5,748,350) is cited to show a bi-directional (150, fig. 10A) optical multiplex/demltiplex transmission system (col. 9, lines 53-67, col. 10, lines 1-65 and fig. 10A) that is comprised of coarse wavelength division mux/demux unit (153, 156, fig. 10A) and a plurality of fine mux/demux units (154_1, 154_2, 154_3, 154_n, fig. 10A).

Pan et al. (Us patent No: 5,652,814) is cited to show an optical demltiplex transmission system (fig. 25) that is comprised of a coarse wavelength division demultiplex unit (271, fig. 25) and a plurality of fine demultiplexer units (274, 275, 276, 277, fig. 25).

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. R. Sedighian whose telephone number is (703) 308-9063. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703) 305-4729. The fax phone numbers for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

JASON CHAN
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